

Background



Weaknesses have been identified in sitewide groundwater and environmental management systems.

During the January 1997 Office of Oversight interim evaluation, weaknesses were identified in the BNL and DOE approach to groundwater management systems involving the tritium plume. The February 1997 interim report identified opportunities to improve groundwater protection and environmental monitoring systems. The opportunities for improvement identified potential actions for DOE and BNL to consider in areas such as sitewide prioritization and location of groundwater monitoring wells, down-gradient monitoring at other BNL facilities identified as containing significant tritium inventories, funding methodologies for the sitewide groundwater monitoring program, and application of lessons learned.

There has been a history of chemical and radiological releases to surface and groundwater on the BNL site. In recent years, the focus has been on addressing high priority response actions to provide public water hookup to homes south of the site, to cap inactive landfills, to remove underground storage tanks, to excavate cesspools, to remove above-ground radiological waste tanks, and to install two groundwater pump-and-treat systems to minimize any additional offsite contamination. In addition to the restoration program, BNL is required by DOE orders to establish an environmental protection program, including effluent monitoring and

environmental surveillance. DOE requires monitoring of groundwater that is or could be affected by site activities to determine the effects of operations on groundwater quality and to demonstrate compliance with applicable Federal, state, and local laws and regulations.

Results

Initiatives to improve BNL's sitewide safety management relating to the tritium release include development of a funding request to support a groundwater monitoring program, investigating other sources of tritium, a three-phase EPA review of BNL, and a facility-specific vulnerability study for each facility. These activities are providing feedback and lessons learned that are being shared across BNL's facilities as well as the DOE laboratory complex.



BNL has taken actions to enhance groundwater protection programs.

BNL has increased management focus and support of programs and activities to ensure groundwater protection. BNL has generated funding requests of \$500,000 for each of the next two fiscal years to establish a groundwater monitoring program at key research and support facilities to ensure that the potential chemical or radiological leaks will be detected early and to maintain public and regulatory trust in operations. The funding request is supported by a risk-ranking weighting factor that applies a management adjustment factor for considering the potential for site activities to impact the sole source groundwater aquifer. This groundwater monitoring program outlines plans for installation of new wells at the Alternating Gradient Synchrotron, Brookhaven Linac Isotope Producer, Linear Accelerator, Environmental Waste Technology

Center (Bldg 830), Waste Compacting Facility, Relativistic Heavy Ion Collider beam stops, Biology Department, site southern boundary, Chemistry Building, the Sewage Treatment Plant, and the rifle and shotgun ranges. In addition, funding projections have considered the need for additional wells as may be needed in response to other site vulnerability studies. However, implementing these efforts is dependent on DOE funding the BNL Environment, Safety, and Health Management Plan. That plan now defines these activities at the highest priority level. DOE will need to supplement or reallocate funding to support these additional efforts.

BHG and BNL have also demonstrated an increased commitment to environmental protection through aggressively investigating the potential for tritium groundwater contamination at the pile fan sump and the BMRR. These facilities were identified as potential sources of tritium release to groundwater in light of the HFBR investigation. Groundwater monitoring has been initiated at both locations, and the initial sampling indicates contamination. Additional actions are being implemented to fully characterize the extent of contamination, determine the sources and pathways, and review remedial action options. The approach to these new efforts to monitor key facilities and conduct recent investigations is progressing systematically site-wide.

Two other key initiatives have been implemented site wide to identify potential environmental releases at BNL. An EPA Multi-Media Review has been implemented in three phases to assess regulatory compliance, process waste management, and environmental management systems. In addition, a separate comprehensive DOE CH/BHG/BNL facility-by-facility vulnerability study is in progress to review historic and current operations that may impact the environment.

The EPA has communicated results of its Phase I inspection field activities to the Department indicating some potential regulatory noncompliances. EPA Region II continues to request large amounts of related documentation from BHG and BNL in several specific program areas. Phase II efforts involve a review of all chemicals and processes on site in an effort to define a raw material and waste management “mass balance” of site operations, down to the level of individual bench-scale experiments. Phase III is an effort to define environmental management system audit criteria by which future reviews will evaluate Department and contractor implementation compliance. EPA intends

to enter into an interagency agreement with the Department defining these management system elements. All of these EPA activities are requiring a significant and increasing level of BHG and BNL management and technical resources as the scope and objectives appear to be expanding.



DOE and BNL are performing a comprehensive review of potential vulnerabilities at BNL facilities.

The sitewide facility-by-facility vulnerability study is a comprehensive process for collecting and analyzing historical and current facility information to identify concerns and corrective actions. Document reviews, retiree and employee interviews, and detailed inspections of the largest (Priority 1) facilities have been completed. Environmental management and technical expertise were provided from several national laboratories to support this effort, at the request of CH. These experts have reviewed documents and inspected facilities to identify potential environmental protection concerns. Some immediate actions and sampling have been conducted to mitigate and quantify potential concerns. The remaining site facilities are being reviewed under the Priority 2 phase of the study. If the envisioned level of effort can be sustained, Phase 2 efforts are scheduled for completion by September 30, 1997.

These efforts have clearly reinforced BNL line management ownership of environmental protection responsibilities. The facility-by-facility vulnerability study requires line managers to collect historical data, inspect current operations, define corrective actions, and maintain an ongoing historical record of activities beyond this baseline effort. Also, the comprehensive review of all BNL facilities has resulted in clearly defined program ownership for all site buildings.

This followup review identified indications of a greater level of openness in communications within BNL, between BNL and other DOE sites, and between BNL and the public. For example, the facility-by-facility vulnerability study has utilized expertise from across the Department’s national laboratories, thereby providing an avenue for passing on the lessons learned and corrective actions. Also, BNL is communicating with the Savannah River Site in an effort to share experiences and explore innovations in real time monitoring technology for tritium releases.

Assessment of Groundwater and Environmental Management Systems



Groundwater and environmental management systems at BNL are improving.

The ongoing efforts to actively and proactively manage the environmental protection program at BNL demonstrate significant improvements since the February 1997 Office of Oversight interim report. The installation of groundwater monitoring wells at the BMRR and the ongoing investigation reflect the application of lessons learned from the HFBR experience. Expanding environmental protection efforts to sitewide programs of investigation, monitoring, and corrective actions as a high priority reflects a clear and significant change in management focus.

Maintaining the level of effort and resources to meet the increased emphasis on environmental protection will require a sustained commitment in the

short term and substantial increase in commitment of resources in the long term to address newly identified contamination or non-compliances.

The continued stretching of site resources and personnel to meet the demands of the EPA Multi-Media Review and the Phase 2 vulnerability study is rapidly approaching its limits. The inability of the site to respond in a timely manner to EPA information requests and the delays in negotiating the scope of Phase 2 and 3 activities reflect the strain on resources. The EPA Phase 3 negotiations toward an interagency agreement on enforceable environmental management system criteria may have adverse implications for the new BNL contract and across the Department if the criteria are not aligned with the integrated safety management policy (DOE P 450.4, Safety Management System). The negotiations between DOE and EPA need to be actively supported at the Headquarters program office level and the EH Office of Environment.

As the site moves to a more proactive posture by installing monitoring wells at all facilities and continues to aggressively identify additional potential vulnerabilities, a substantial increase in the long-term resource allocation for environmental protection programs may be necessary.